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OCT 1 1 2006

WHAT IS CLAIMED IS:

1. (amended) A method of providing a controlled current to an electronic device, comprising: producing a pulse-width modulation (PWM) signal to provide said current; measuring an average of said current provided to the electronic device using a dual-slope integrator, wherein said measuring an average of said current results in a measured average current; and

setting a duty cycle of said pulse-width modulation signal based, at least in part, on said measuring[.];

wherein said setting a duty cycle comprises:

comparing said measured average current to an input value representing a desired average current; and

regulating said duty cycle of said pulse-width modulation signal based on said comparing;

wherein said duty cycle is computed by scaling said input value by a multiplicative factor and adding an additive factor; and

wherein said regulating comprises:

if said comparing indicates that said measured average current is less than said desired average current, increasing the additive factor by a first fixed amount;

if said increasing the additive factor by a first fixed amount results in said additive factor exceeding a limit: zeroing said additive factor; and increasing said multiplicative factor by a second fixed amount;

if said comparing indicates that said measured average current is greater than said desired average current, decreasing the additive factor by a first fixed amount; and

if said decreasing the additive factor by a first fixed amount results in said additive factor falling below a limit: zeroing said additive factor; and decreasing said multiplicative factor by a second fixed amount.

2. (original) The method of claim 1 wherein said measuring an average of said current comprises: during a sampling interval, integrating a signal proportional to said current using said dual-slope integrator, said integrating resulting in an integrated signal;

determining a magnitude of said integrated signal; and using said magnitude of said integrated signal and a length of said sampling interval to calculate a measured average current.

3. (original) The method of claim 2 wherein said integrating comprises charging a capacitor from an initial level to a final level and wherein said determining a magnitude comprises calculating a time for discharging said capacitor at a known rate from said final level to said initial level.

4. (original) The method of claim 2 wherein said sampling interval is a PWM period.

5. (original) The method of claim 4 wherein said PWM period is a first PWM period, and wherein said determining a magnitude is performed during a second PWM period immediately following said first PWM period.

6. (original) The method of claim 5 wherein said setting a duty cycle is effective in said pulse-width modulation signal during a third PWM period immediately following said second PWM period.

7. cancelled.

8. (amended) The method of claim [7] 1 wherein said input value is a digital representation of an input voltage.

9-13. cancelled.

14. (original) The method of claim 1 wherein said setting a duty cycle comprises scaling an input value representing a desired average current by a multiplicative factor and adding an additive factor, said scaling and adding resulting in a calculated duty cycle.

15. (original) The method of claim 14 wherein said scaling and adding are completed

during a first PWM period and said calculated duty cycle is effective in said pulse-width modulation during a second PWM period immediately following said first PWM period.

16. (amended) A system for providing a controlled current to an electronic device, comprising:

a pulse-width modulation (PWM) signal generator for providing said current;

a dual-slope integrator for use in measuring an average current supplied to the electronic device, said measuring resulting in a measured average current; [and]

a duty cycle calculator for calculating a duty cycle of said pulse-width modulation based, at least in part, on said measured average current[.]; wherein said duty cycle calculator calculates said duty cycle by scaling said input value by a scalar and adding an additive factor, said scaling and adding resulting in a calculated duty cycle;

an error calculator for comparing said measured average current to an input value representing a desired average current and for calculating an error value based on said comparing, wherein:

if said error value indicates that said measured average current is less than said desired average current, said duty cycle calculator increases the additive factor by a first fixed amount;

if said additive factor exceeds a limit, said duty cycle calculator: zeroes said additive factor; and increases said multiplicative factor by a second fixed amount;

if said error value indicates that said measured average current is greater than said desired average current, said duty cycle calculator decreases the additive factor by a first fixed amount;

if said additive falls below a limit, said duty cycle calculator: zeroes said additive factor; and decreases said multiplicative factor by a second fixed amount.

17. (original) The system of claim 16 wherein said measuring an average current comprises: during a sampling interval, integrating a signal proportional to said current using said dual-slope integrator, said integrating resulting in an integrated signal; determining a magnitude of said integrated signal; and using said magnitude of said integrated signal and a length of said sampling interval to calculate a measured average

current.

18. (original) The system of claim 17 wherein said sampling interval is a PWM period.

19. cancelled.

20. (amended) The system of claim [19] <u>16</u> wherein said input value is a digital representation of an input voltage.

21. cancelled.

22. (amended) The system of claim [21] <u>16</u> wherein said scaling and adding are completed during a first PWM period and said calculated duty cycle is effective in said pulse-width modulation during a second PWM period immediately following said first PWM period.

23 - 26. cancelled.

27. (original) The system of claim 16 wherein said duty cycle calculator calculates said duty cycle by scaling an input value representing a desired average current by a scalar and adding an additive factor.

28. (original) The system of claim 27 wherein, if said input value is received during a first PWM period, said duty cycle calculator calculates said duty cycle for effectiveness in said pulse-width modulation signal during a second PWM period, said second PWM period immediately following said first PWM period.

29. (amended) A computer-readable medium storing instructions which, when executed by a computing device in a system for providing a controlled current to an electronic device by way of a pulse-width modulation (PWM) signal, cause said computing device to:

(a) calculate from measurements produced by a dual-slope integrator a measured average current supplied to the electronic device; and
(b) set a duty cycle of said pulse-width modulation signal based, at least in part, on said measured average current[.] comprises:

comparing said measured average current to an input value representing a desired average current; and

regulating said duty cycle of said pulse-width modulation signal based on said comparing;

wherein said duty cycle is computed by scaling said input value by a multiplicative factor and adding an additive factor;

wherein said regulating comprises:

if said comparing indicates that said measured average current is less than said desired average current, increasing the additive factor by a first fixed amount;

if said increasing the additive factor by a first fixed amount results in said additive factor exceeding a limit: zeroing said additive factor; and increasing said multiplicative factor by a second fixed amount;

if said comparing indicates that said measured average current is greater than said desired average current, decreasing the additive factor by a first fixed amount; and

if said decreasing the additive factor by a first fixed amount results in said additive factor falling below a limit: zeroing said additive factor; and decreasing said multiplicative factor by a second fixed amount.

30. (original) The computer-readable medium of claim 29 wherein (a) comprises: determining a duration of de-integration of an integrated signal, said integrated signal having been integrated during a sampling interval by said dual-slope integrator from a signal proportional to the current provided to said electronic device; and using said duration and a length of said sampling interval to calculate said measured average current.

31. (original) The computer-readable medium of claim 30 wherein said sampling interval

is a PWM period.

32. cancelled.

33. (amended) The computer-readable medium of claim [32] 29 wherein said input value is a digital representation of an input voltage.

34 - 38. cancelled.

39. (original) The computer-readable medium of claim 29 wherein (b) comprises scaling an input value representing a desired average current by a multiplicative factor and adding an additive factor, said scaling and adding resulting in a calculated duty cycle.

40. (original) The computer-readable medium of claim 39 wherein said scaling and adding are completed during a first PWM period and said calculated duty cycle is effective in said pulse-width modulation during a second PWM period immediately following said first PWM period.